694 Cop. 2
LIBRARY
RECEIVED
MAY 25 1942
U.S. DEPARTMENT OF AGRICULTURE
BELTSVILLE BRANCH

LIBRARY
CURRENT SERIAL RECORD
JUL 30 1943
U.S. DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
BUREAU OF PLANT INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE

Volume XXVI May 1, 1942 Number 8

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

IN THIS ISSUE

Check list revision, by Freeman Weiss, page 176.

C. O. Johnston discusses the reasons for the unusual development of some diseases, especially the rusts of cereals, in his report on plant diseases in Kansas in 1941, page 189.

John A. Stevenson and W. A. Archer record some additions to their list of Nevada fungi, page 196.

The committee of the Potato Association of America to coordinate research on new and unusual potato diseases, T. P. Dykstra, Chairman, send their report on potato ring rot in 1941, page 197.

A severe defoliation of tomatoes in Indiana appears to be caused by manganese deficiency and can be controlled by spraying with manganese sulfate, according to H. Rex Thomas, page 198.

R. W. Henderson reports the occurrence of the stem nematode on red clover in New York, page 199.

Development of apple scab, page 200.

P. J. Anderson reports a successful spray material for the control of tobacco downy mildew, page 201.

Thiuram disulfide gave promising results in the control of turf diseases and of damping-off, according to P. P. Pirone, page 202.

CHECK LIST REVISION

Freeman Weiss

RHODOTYPOS (ROSACEAE)

RHODOTYPOS SCANDENS (Thunb.) Mak., BLACK JETBEAD. Deciduous shrub of E. Asia, cult. for ornament, Zone IV.

Ascochyta rhodotypi H. W. Anderson, leaf spot. Ill.
Gloeosporium sp. (? G. nervisequum Fckl.), anthracnose. Ill.
Nectria cinnabarina Tode ex Fr., coral spot twig blight. Mass.

RHUS (ANARCARDIACEAE)

RHUS AROMATICA Ait., FRAGRANT SUMAC. Shrub of Growth Regions 20, 22, 23, 24, 25, 26, 27, 28, 29; food plant for wild life, sometimes planted for ornament, Zone V. Also R. TRILOBATA Nutt., SKUNKBUSH SUMAC, occurring from Ill. to the Pacific Coast.

Cercospora rhoina Cke. & Ell., on leaves. Ala., Calif., Mo.
Cladosporium aromaticum Ell. & Ev., on leaves. Calif.
Cuscuta exaltata Engelm., dodder. Texas.
Diplodia resurgens Cke. & Harkn., on branches. Calif.
Pezizella oenotherae (Cke. & Ell.) Sacc. (Hainesia rhoina Ell. & Sacc.), on leaves. N.J.
Phleospora irregularis (Pk.) Petr., leaf spot. Mont.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora mutila (Fr.) N.E. Stevens (Diplodia rhuina Cke. & Harkn.), on branches. Calif.
Pileolaria patzcuarensis (Holw.) Arth., rust (O,I,II,III). Colo., N.Mex., Okla. On R. trilobata.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Conn., Ind.
Verticillium albo-atrum Reinke & Berth., wilt. Mass.

RHUS COPALLINA L., FLAMELEAF SUMAC. Shrub or small tree of Growth Regions 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 32; grown for ornament, Zone IV, and food plant for wildlife. Also R. MICHAUXI Sarg., MICHAUX SUMAC, of G.R. 28.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on branches. Ga.
Cercorpora rhoina Cke. & Ell. (C. copallina Cke.), on leaves. Mass. to Fla., Texas & Kans.
C. r. var. nigromaculans Pk. N.Y.
Cryptodiaporthe aculeans (Schw.) Wehmeyer (Sporocybe rhois (Berk. & Curt.) Sacc.), dieback, canker. N.Y. to Ga., Miss. & Mo.
Cuscuta exaltata Engelm., dodder. Texas.
Cylindrosporium irregulare (Pk.) Dearn. (C. toxicodendri (Ell. & Mart.) Ell. & Ev.), leaf spot. See Phleospora.

RHUS COPALLINA -- continued

Daldinia concentrica Bolt. ex Fr., wood rot. Cosmopolitan.
Diaporthe spiculosa (Alb. & Schw. ex Fr.) Nits., on branches. Ala.
Dothidea rhois Schw. ex Fr., on leaves. N.Car.
Pezizella oenotherae (Cke. & Ell.) Sacc., leaf spot. Md., N.J., Va.
Phleospora irregularis (Pk.) Bubak, leaf spot. Widespread. (Reported variously as Gloeosporium, Septoria, Cylindrosporium and Marssonina, usually with the epithet toxicodendri.)
Phoma pulchella (Berk. & Curt.) Sacc., on branches. S.Car.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. Ala.
Polyporus poculum (Schw.) Berk. & Curt., wood rot. W.Va.
Poria cocos (Schw. ex Fr.) Wolf, root rot. Fla.
Septoria rhoina Berk. & Curt., leaf spot. Fla., Mich., N.J.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Vt. to Mo.
Sporocybe rhois (Berk. & Curt.) Sacc., on branches. Conidial stage of Cryptodiaporthe aculeans.
Stemphylium copallinum Ell. & Ev., on leaves. Ala.
Stereum rameale Schw. and S. sericeum Schw., wood rot. Md., W.Va.
Taphrina purpurascens (Ell. & Ev.) Robinson, leaf blister. Widespread.
Tryblidiella rufula (Spreng. ex Fr.) Sacc., on branches. Gulf States.

RHUS GLABRA L., SMOOTH SUMAC, and R. TYPHINA L., STAGHORN SUMAC. Shrubs or small trees, the former sp. occurring throughout the U. S. except the far West, the latter in the N.Central and Eastern States; both spp. furnish food for wildlife, and are grown for ornament, having cut-leaved forms.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug. (? B. ambigua (Schw.) Sacc.), on branches. Ga., Pa., Va.
(B. sumachi (Schw.) Cke.): Physalospora obtusa.
Cercospora rhoina Cke. & Ell., on leaves. N.J. to Ala., Texas & Wis.
Cladosporium aromaticum Ell. & Ev., on leaves. Iowa, Nebr., Wis.
C. nervale Ell. & Dearn. Wis.
Corticium galactinum (Fr.) Burt., white root rot. Va.
Cryptodiaporthe aculeans (Schw.) Wehmeyer, dieback, canker. Me. to Ala. & Iowa.
Cryptosporella leptasca (Pk. & Clint.) Sacc., on branches. N.Y.
Cytospora grandis Pk., on branches. Ala., N.Y.
C. rhoina Fr. Mich., N.Y., W.Va.
Diaporthe spiculosa (Alb. & Schw. ex Fr.) Nits. (D. rhoina (Cke. & Ell.) Ell. & Ev.), on branches. Mass. to N.J. & Ill.
Mycosphaerella nigredo (Schw.) Lindau, on leaves. Pa.
Myxosporium rhois (Berk. & Curt.) Sacc., on twigs. W.Va.
Nectria cinnabarina Tode ex Fr., on branches. N.Y.
Pezizella oenotherae (Cke. & Ell.) Sacc., leaf spot. Ga., Va., W.Va.
Phoma pulchella (Berk. & Curt.) Sacc., on branches. Me.
Phyllosticta sp., leaf spot. Minn.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

RHUS GLABRA -- continued

Physalospora spp., on branches, perhaps causing canker & dieback. P. fusca N.E. Stevens and P. rhodina (Berk. & Curt.) Cke., Fla.; P. obtusa (Schw.) Cke. (with numerous synonyms on Rhus as Botryosphaeria sumachi (Schw.) Cke., Haplosporella rhoina Dearn. & Barth. and H. sumachi (Schw.) Ell. & Ev., Macrophoma rhoina (Schw.) Sacc., and Sphaeropsis sumachi (Schw.) Cke. & Ell.), widespread.

Pileolaria effusa Pk., rust (O,III). Ariz. On R. cismontana Greene, a form of R. glabra.

Polyporus hirsutus Wulf. ex Fr., wood rot, sometimes on living plants.

Schizophyllum commune Fr., wood rot, sometimes on living plants. Widespread.

(Septoria irregularis Pk.): Phleospora irregularis.

S. rhoina Berk. & Curt. ex Sacc., leaf spot. Vt. to Kans. & Minn.

Sphaerotheca humuli (DC.) Burr., powdery mildew. Widespread.

Tryblidiella rufula (Spreng. ex Fr.) Sacc., on branches.

Verticillium albo-atrum Reinke & Berth., wilt. Ill., Iowa.

RHUS INTEGRIFOLIA (Nutt.) Benth. & Hook., LEMONADE SUMAC, SCURBERRY. Evergreen shrub of Growth Regions 5 & 10; the plant used for ground cover and the berries for beverage. Also several other evergreen spp. of the West Coast, as R. LAURINA Nutt., LAUREL SUMAC, R. OVATA Wats., SUGAR SUMAC and R. VIRENS Lindh., used for ground cover and ornament.

Armillaria mellea Vahl ex Fr., root rot. Calif.

Cercospora rhoina Cke. & Ell., on leaves. Texas.

Coniothyrium rhois Tharp, on leaves. Texas.

Harknessia rhoina Ell. & Ev., on leaves. Calif.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

Telimena rhoina (Ell. & Ev.) Theiss. & Syd., on leaves. Calif.

Thyronectria virens Harkn., on twigs. Calif.

Xylogramma nigerrimum (Ell. & Ev.)Rehm, on twigs. Calif.

RHUS TOXICODENDRON L., POISON-IVY, POISON-OAK. Including R. DIVERSILOBA Torr. & Gray, POISON-OAK of the West Coast, and R. RADICANS L., POISON-IVY, of the Eastern States. Low shrubs to climbing vines distributed throughout the U.S.; poisonous to man, but serves as food for wildlife and forage for livestock.

Botryosphaeria ambigua (Schw.) Sacc., on stems. Calif., S.Car.

Cercospora bartholomaei Ell. & Kell., on leaves. Kans.

C. rhoina Cke. & Ell., Ala., Mont.

C. toxicodendri Ell., Mass. to Iowa & Texas; Calif.

Cuscuta exaltata Engelm., dodder. Texas.

Cylindrosporium irregulare (Pk.) Dearn. (C. toxicodendri (Ell. & Mart.) Ell. & Ev.). See Phleospora.

Diaporthe spiculosa (Alb. & Schw. ex Fr.) Nits. (D. rhoina Cke. & Ell.), on stems. Ill.

D. peckii (Sacc.), on stems. Mich., N.Y.

RHUS TOXICODENDRON -- continued.

Helicobasidium purpureum (Tul.) Pat., root rot. Texas.
Ophiocarpella tarda (Harkn.) Theiss. & Syd., on leaves. Calif.
Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves & stems. N.Y., Tenn., Va.
Phleospora irregularis (Pk.) Bubak, leaf spot. Widespread.
Phoradendron villosum Nutt., mistletoe. Calif., Oregon.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich., Wash.
Phyllosticta rhoicola Ell. & Ev., on leaves. N.Y., W.Va.
P. toxica Ell. & Mart. Ill., Iowa, Miss.
P. toxicodendri Thüm. S.Car.
Physalospora obtusa (Schw.) Cke., on stems or branches. N.Y.
Pileolaria effusa Pk., rust (O,III). Colo. (On R. rydbergii).
P. mexicana Arth., rust (II). Texas. On R. chloriophylla.
P. toxicodendri (Berk. & Rav.) Arth., rust (O,I,II,III). General.
Polyporus spp., wood rot, sometimes of living plants. P. adustus Willd. ex Fr., Md.; P. arcularius Batsch ex Fr., Va.; P. dryadeus Pers. ex Fr.; P. gilvus (Schw.) Fr., Md.; P. hirsutus Wulf. ex Fr., Md.; P. unitus Pers., Mich.
Septoria irregularis Pk. (S. toxicodendri (Ell. & Mart.) Mart.) See Phleospora irregularis.
Tryblidiella rufula (Spreng. ex Fr.) Sacc., on stems & twigs. Calif., Ga., Miss.

RHUS VERNIX L., poison sumac. Shrub or small tree of Growth Regions 22, 23, 24, 25, 26, 27, 28, 29, 30; furnishes food for wildlife.

Cercospora infuscans Ell. & Ev., on leaves. Del.
C. rhoina Cke. & Ell. Ala.
Cryptodiaporthe aculeans (Schw.) Wehmeyer, on branches. Md., N.J.
Diaporthe spiculosa (Alb. & Schw.) Nits., on branches. Ill., Mass., N.J.
D. peckii Sacc. Mich.
Hypoxylon morsei Berk. & Curt., on branches, ? canker. Ind., N.Y.
Phyllosticta rhoina Kalchbr. & Cke., on leaves. Mich.
Physalospora obtusa (Schw.) Cke., on branches. N.J.
Schizophyllum commune Fr., wound rot. Mass.
Sphaeronema pruinosum Berk. & Curt., on branches. Pa.

RIBES (SAXIFRAGACEAE)

RIBES spp., CURRANTS, GOOSEBERRIES. The numerous spp. of Ribes can be grouped for the purpose of this list into (1) currants cult. for fruit, (2) currants cult. for ornament, (3) cult. gooseberries, (4) native spp., both currants & gooseberries, chiefly furnishing food for wildlife.

RIBES spp. (1), Currants cult. for fruit. R. SATIVUM Syme, COMMON RED CURRANT, native of W. Europe, cult., Zone IV, and locally naturalized in the East and N. Central States; R. RUBRUM L., NORTHERN RED CURRANT, native of C. and N. Europe and Asia, not cult. as such in the U.S. but a progenitor of the hardiest currant hybrids, Zone III; R. NIGRUM L., EUROPEAN BLACK CURRANT, native of Europe to C. Asia, Zone IV.

Alternaria sp., leaf spot. Mich.
Armillaria mellea Vahl ex Fr., root rot. Calif., Oregon, Wash.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug. var. chromogena Shear et al., cane blight. Mass. to Va. & Ill.; Calif. The non-chromogenic form is probably saprophytic.
Botrytis cinerea Pers., dieback, leaf spot, gray mold of fruit. N.E. States, Oregon, Wash.
(Cenangium ribis Fr.): Scleroderris ribis (Fr.) Keissler?, on twigs. Calif.
Cercospora angulata Wint., angular leaf spot. N.Y. to Va., Kans. & Minn.
C. ribis Earle. Ala., Ind., Iowa.
Corticium stevensii Burt, thread blight. Fla.
Cronartium ribicola Fischer, white pine blister rust (II,III). Me. to Va., Ill. & Minn.; Oregon, Wash. O and I on 5-needle pines. (The var. Viking (R. petraeum x R. rubrum) is highly resistant).
Cylindrosporium ribis Davis, leaf spot. Wis.
Cytospora grossulariae Laubert, on twigs. Md.
(Dothidella ribesia (Pers. ex Fr.) Theiss. & Syd.): Phragmodothella ribesia.
(Dothiorella ribis (Fckl.) Sacc.): Botryosphaeria ribis.
Fomes ribis (Schum. ex Fr.) Gill., collar rot. N.Y. to Ind.& Minn.; Utah.
Gloeosporium ribis (Lib.) Mont. & Desm. (Gloeosporidiella ribis (Lib.) Petr.). Conidial stage of Pseudopeziza ribis.
Glomerella cingulata (Ston.) Spauld.& Schrenk, berry rot. Conn.
Hypholoma perplexum Pk., root rot. N.Y.
Leptosphaeria coniothyrium (Fckl.) Sacc., on canes. Alaska.
L. vagabunda Sacc. Mich.
(Macrophoma hyalina (Berk. & Curt.) Berl. & Vogl.): Physalospora obtusa.
Microsphaera grossulariae (Wallr.) Lév., European powdery mildew. Mont., Nebr., N.H.
Mycosphaerella ribis (Fckl.) Feltgen (Septoria ribis Desm.), leaf spot. Me. to Md., Ark., Oregon & Wash. (The change from the more familiar M. grossulariae (Fr.) Lindau is due to the fact that Sphaeria grossulariae Fr. on which this is based appears to be a quite different fungus from that causing leaf spot. The latter was described as Sphaerella ribis Fckl. in 1869; the change to Mycosphaerella is often ascribed to Klebahn (1918) but was published by Feltgen in 1899.)
Nectria cinnabarina Tode ex Fr., coral spot canker; dieback. Me. to Colo. & Wash.; Alaska
N. ditissima Tul. (? N. coccinea Pers. ex Fr.), canker. Minn., N.Y.

RIBES spp. (1) -- continued.

Phragmodothella ribesia (Pers. ex Fr.) Petr., black pustule, dieback. N.E. States, Pacific Northwest, Alaska.

Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich.

Phyllosticta grossulariae Sacc., leaf spot. N.J., N.Y., Wis. (Spermatial stage of Mycosphaerella ribis?)

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

Physalospora obtusa (Schw.) Cke., on dead canes. Mass. to Va. & Mich.

Plasmopara ribicola Schroet., downy mildew. Wis.

(Plowrightia ribesia (Pers. ex Fr.) Sacc.): Phragmodothella ribesia.

Pseudopeziza ribis Kleb. (Gloeosporium ribis (Lib.) Mont. & Desm.), anthracnose (leaf, stem & fruit spot). General. (Recent authors have called this Drepanopeziza ribis (Kleb.) Höhn.)

Puccinia caricis (Schum.) Schroet. var. grossulariata Arth., rust (O,I). Conn., Ind., Md., N.Y., Alaska. II & III on Carex spp.

P. ribis DC., rust (III). Ohio to Minn. & Nebr.

Septoria ribis Desm. (S. grossulariae (Lib.) Westend. and S. sibirica Thüm.). Conidial stage of Mycosphaerella ribis.

(Sphaeropsis hyalina Berk. & Curt. and S. ribicola Cke. & Ell.): Physalospora obtusa.

Sphaerotheca mors-uvae (Schw.) Berk. & Curt., American powdery mildew. Calif., Conn., Mont., Nebr., Wash., Alaska.

Thyronectria berolinensis (Sacc.) Seaver, cane knot. Conn. to Ind., Kans. & Utah.

Verticillium sp., wilt. N.Y.

Crinkle leaf, cause unknown. N.Y.

Mosaic, undet. virus. Md., N.Y. On red currants.

Witches'-broom, cause unknown. N.Y.

Yellow leaf, cause unknown. N.Y.

RIBES spp. (2) Currants cult. for ornament. R. AUREUM Pursh, GOLDEN CURRANT, shrub of Growth Regions 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 22, 23; cult., Zone II; R. ODORATUM Wendl., CLOVE CURRANT, of G.R.'s 15, 16, 18, 19, 20, 22, 23, 25; cult., Zone IV; R. SANGUINEUM Pursh, RED-FLOWERED CURRANT, of G.R.'s 1, 2, 4; cult., Zone V. Several other native currants, some vars. of R. NIGRUM, and R. ALPINUM L., ALPINE CURRANT, of Europe, also are grown for ornament.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., dieback. Kans.

Botrytis cinerea Pers., dieback, ? witches'-broom. Alaska, Ind.

Cercospora angulata Wint., angular leaf spot. Minn.

C. ribicola Ell. & Ev., leaf spot. Oregon, Wash.

Coleosporium jonesii (Pk.) Arth., rust (II,III). Minn. to Ariz. and Idaho. O & I on Pinus edulis.

Cronartium occidentale Hedgc., Bethel & Hunt, piñon blister rust. Mont. to N.Mex. Calif. & Wash. Especially on R. aureum; O & I on P. monophylla and P. edulis.

C. ribicola Fischer, white pine blister rust (II,III). Me. to Md., Colo., & Minn. on R. aureum or R. odoratum; Pacific Coast States on R. sanguineum. Some pistillate clones of R. alpinum are susceptible but at least one staminate clone is immune.

RIBES spp. (2)-- continued.

Glomerella cingulata (Ston.) Spauld. & Schrenk, berry rot. Conn.
Marssonina ribicola (Ell. & Ev.) P. Magn., leaf spot. Colo.
Melampsora ribesii-purpureae Kleb., rust (O,I). Utah. On R. aureum. II & III on Salix spp.
Mycosphaerella aurea (Ell. & Ev.) Stone (Septoria aurea Ell. & Ev. and var. destruens Ell. & Ev.), leaf spot. N.Y. to Kans. & S.Dak.; Wash.
M. ribis (Fckl.) Feltgen, leaf spot. N.Y. to Kans., Minn. & Utah.
Nectria cinnabarina Tode ex Fr., coral spot dieback. Alaska, Kans.
Phragmodothella ribesia (Pers. ex Fr.) Petr., black pustule, dieback. N.Y.
Phyllosticta grossulariae Sacc., leaf spot. Ind.
Pseudopeziza ribis Kleb., anthracnose. Minn., Mont.
Puccinia caricis (Schum.) Schroet. var. grossulariata Arth., rust (O,I). N.Y. to Iowa, Calif. & Oregon; Alaska
P. micrantha Griff., rust (O,I). Nebr., Wyo. On R. aureum. II & III on Oryzopsis micrantha.
P. parkerae Diet. & Holw., rust (III). Wash. On R. sanguineum.
Septoria aurea Ell. & Ev. : Conidial stage of Mycosphaerella aurea.
S. sanguinea Dearn., leaf spot. Wash.
Thyronectria berolinensis (Sacc.) Seaver, cane knot. Kans.

RIBES spp. (3), Cultivated gooseberries, R. GROSSULARIA L., EUROPEAN GOOSEBERRY, shrub of Europe and W. Asia, parent of hort. vars. infrequently cult. in U.S., Zone IV, and of hybrids with the following: R. HIRTELLUM Michx., HAIRYSTEM GOOSEBERRY, shrub of Growth Regions 15, 18, 21, 23, 24, 26, 27; principal source of American cult. vars., Zone III.

Aphelenchoides fragariae (Ritzema Bos) Christie, infesting buds. Calif.
Armillaria mellea Vahl ex Fr., root rot. Oregon, Wash.
Botryosphaeria ribis Tode ex Fr., cane blight. N.J., Va.
Botrytis cinerea Pers., dieback. Conn., Oregon, Wash.
Cercospora angulata Wint., leaf spot. N.Y. to Mich. & Mo.
Coleosporium jonesii (Pk.) Arth., rust (II,III). Colo., Minn., N.Mex., Wis., Wyo.
Corticium stevensii Burt, thread blight. Fla.
Cronartium occidentale Hedgc., Bethel & Hunt, rust (II,III). Ariz., Colo., Utah.
C. ribicola Fischer, rust (II,III). Vt. to Va. & Minn.; Calif. (Chiefly on American gooseberries, the European vars. being resistant).
Cuscuta sp., dodder. Minn., N.Y.
Dematophora sp., root rot. N.Y.
Diaporthe eres Nits.(D. concrescens (Schw.) Cke. and D. pungens Nits.) on twigs. Alaska.
Hendersonia grossulariae Cud., on canes. N.Y.
Leptosphaeria coniothyrium (Fckl.) Sacc. (Coniothyrium fuckelii Sacc.), cane blight. Ind., Mo.
L. vagabunda Sacc. (?Coniothyrium ribis Brun.), on canes & twigs. Alaska.

RIBES spp. (3) -- continued.
Marssonina grossulariae (Oud.) P. Magn., leaf spot. Ohio, Wis. (? Septoria ribis Desm.).
Microsphaera grossulariae (Wallr.) Lév., European powdery mildew. Calif., Idaho.
Mycosphaerella ribis (Fckl.) Feltgen (Septoria ribis Desm.), leaf spot. Mass. to Va., Kans. & Minn.; Oregon to Alaska.
Nectria cinnabarina Tode ex Fr., coral spot dieback. Minn.
Phoma ribis Ell. & Barth., on twigs. Kans.
Phragmodothella ribesia (Pers. ex Fr.) Petr., twig knot, dieback. Oregon.
Phyllactinia corylea Pers. ex Karst., powdery mildew. N.Y.
Phyllosticta grossulariae Sacc., leaf spot, fruit spot. Conn., N.J., Wash., Wis.
Physalospora obtusa (Schw.) Cke., dieback. N.Y. to Va. & Kans.
Plasmopara ribicola Schroet., downy mildew. Minn., Oregon, W.Va., Wis.
Pseudopeziza ribis Kleb., anthracnose. General.
Puccinia caricis (Schum.) Schroet. var. grossulariata Arth., rust (O,I) on leaves & fruit. Me. to Md., Miss., Kans. & Idaho, Alaska.
P. caricis uniporula (Crton) Arth., rust (O,I). Iowa, Md., N.Y., Wis.
Ramularia sp., leaf spot. Mich.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Ind., Minn.
S. mors-uvae (Schw.) Berk. & Curt., American powdery mildew. General.
Xylaria hypoxylon (L.) Grev., black root rot. Oregon.
Mosaic, unident. virus. Ill., N.Y.
Rosette, cause unknown. Del.

RIBES spp. (4), Miscellaneous native spp. Some furnish edible fruit as R. AMERICANUM Mill., AMERICAN BLACK CURRANT; R. HUDSONIANUM Rich., HUDSON BAY CURRANT; R. TRISTE Pall., SWAMP RED CURRANT; R. INERME Rydb., WHITESTEM GOOSEBERRY; R. OXYACANTHOIDES L., NORTHERN GOOSEBERRY; some are grown for ornament as R. CEREUM Dougl., WAX CURRANT, and R. SPECIOSUM Pursh, FUCHSIA GOOSEBERRY.

Armillaria mellea Vahl ex Fr., root rot. Wash.
Asteroma ribicola Ell. & Ev., on leaves. Mont., N.Y., Wis.
Botryosphaeria ribis (Tode Ex Fr.) Gross. & Dug. and var. chromogena Shear et al., cane blight, dieback. Calif., Conn., Md., N.J.
Cenangella oricostata Cash, on twigs. Colo., Utah.
Cercospora angulata Wint., leaf spot. Kans.
C. coalescens Davis, on leaves. Wash.
C. ribicola Ell. & Ev., Calif., Oregon, Wyo., Wis., Wash., Idaho.
C. ribis Earle. Kans.
Ceriospora ribis P. Henn. & Plottn. on canes. Alaska, Oregon.
Clypeopycnis aeruginascens Petr., on twigs. Alaska, S.Dak.
Cladosporium sp. and C. herbarum Lk., leaf blight. Alaska, Wash.
Coleosporium jonesii (Pk.) Arth., rust (II,III). Wis. to N.Mex., Calif. & Wash. On currants & gooseberries; O & I on Pinus edulis.
Coniophora corrugis Burt, wood rot. Wyo. to Ariz.

RIBES spp. (4) -- continued.

Cronartium occidentale Hedgc., Bethel & Hunt, piñon blister rust (II, III). Kans. to N.Mex., Calif. & Wash. O & I on Pinus edulis & P. monophylla.

C. ribicola Fischer, white pine blister rust (II,III). Me. to N.Car., Tenn., Iowa & Minn.; Mont. to Wash., Oregon & Calif. O & I on 5-needle pines. (The native spp. are generally susceptible, but R. leptanthum Gray is somewhat resistant.)

Cucurbitaria ribis Niessl, on dead canes. Mont., N.Mex., Va. Colo.

Cylindrosporium ribis Davis, leaf spot, N.Y., Wis.

Diaporthe eres Nits. (D. concrescens (Schw.) Cke., on dead canes. Alaska.

D. strumella (Fr.) Fckl., on dead canes & twigs. Mass. to Mich. & Nebr.; Calif., Alaska.

Gloeosporium bartholomaeiDearn., leaf spot. Wash.

Godronia urceolus (Alb. & Schw. ex Fr.) Karst. (? Mastomyces uberiformis (Fr.) Karst.), on twigs. Alaska, Colo., N.J., N.Dak.

G. davidsoni Cash, Alaska, Colo., Calif.

Graphiothecium vinosum Davis, on leaves. Wis.

Hendersonia grossulariae Oud. Va.

Leptosphaeria coniothyrium (Fckl.) Sacc., on canes. Ind.

L. vagabunda Sacc. Utah.

Marssonina bracteosa Dearn. & Barth., on leaves. Alaska, Wash.

Melampsora ribesii-purpureae Kleb., rust (O,I). Colo. to Calif. & Wash.; Alaska. II & III on Salix spp.

Microsphaera grossulariae (Wallr.) Lév., European powdery mildew. Mont., N.H.

Mycosphaerella ribis (Fckl.) Feltgen (Septoria ribis Desm.), leaf spot. Mass. to Tenn. and Mo., Pacific Coast.

Nectria cinnabarina Tode ex Fr., canker, dieback. Widespread.

Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves. Me., Md.

Phragmodothella ribesia (Pers. ex Fr.) Petr. (? P. kelseyi (Ell. & Ev.) Theiss. & Syd.), twig knot. Conn. to Miss. & Wis.; Colo. to Mont. & Oregon; Alaska.

Phyllactinia corylea Pers. ex Karst., powdery mildew. Idaho, Ill., N.Car.; Calif., Wash.

Phyllosticta spp., on leaves. P. canescens Ell. & Ev., Idaho; P. ellisii Sacc. & D. Sacc., W.Va.; P. grossulariae Sacc., Mich. to Ind., Kans. & Wis.; P. ribesicida Speg., Alaska; P. ribis Speg., Va.

Physalospora obtusa (Schw.) Cke., on dead branches. Me. to N.J. and Mich.

Plasmopara ribicola Schroet., downy mildew. Va. to Wis. & Wash.

Polyporus planus Pk., on dead canes. N.Car.

Pseudopeziza ribis Kleb. (Gloeosporium ribis (Lib.) Mont. & Desm.), anthracnose. Widespread. (Gooseberries are generally more severely infected than currants, but some spp. in each group are resistant.)

Pseudovalsa ribesia Sacc. & Scalia, on twigs. Alaska.

RIBES spp. (4) -- continued.

Puccinia caricis (Schum.) Schroet. var. grossulariata Arth., rust (O,I) Me. to Mo.,Calif. and Alaska. On various Ribes spp., both currants & gooseberries; II & III on Carex spp.
P. caricis var. uniporula (Orton) Arth. Similar, reported chiefly on cult. & native gooseberries. N.H. to Ind., Iowa & Wis.
P. micrantha Griff., rust (O,I). Colo., Mont., Nebr., S.Dak., Wyo., Utah. On currants & gooseberries; II & III on Oryzopsis micrantha.
P. parkerae Diet. & Holw., rust (III). Alaska to Mont. & Oregon. On currants & gooseberries.
P. ribis DC., rust (III). Me. to Minn. & Nebr.; Wash. On cult. & native currants.
Ramularia sp., leaf spot. Mich.
Rhabdospora ribicola (Berk. & Curt.) Sacc., on twigs. Wis.
Rhyncophoma raduloides Sacc. & Scalia. Alaska, Calif.
Rosellinia parasitica Ell. & Ev., on dead canes. Idaho, N.Mex.
Scleroderris lobata Cash, on dead twigs. Calif.
S. tumoricola Cash, on twig galls. Colo.
Septoria ribis Desm. (S. grossulariae (Lib.) Westend., S. sibirica Thüm.). Conidial stage of Mycosphaerella ribis.
S. sanguinea Dearn., leaf spot. Wash.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Alaska, Mont.
S. mors-uvae (Schw.) Berk. & Curt., American powdery mildew. Me. to Mo., Calif. & Wash.; Alaska. On both currants & gooseberries.
Thelephora terrestris Ehr. ex Fr., stem girdle. N.H.
Thyronectria berolinensis (Sacc.) Seaver, on canes & twigs. Md. to Ohio, S. Dak. & Oregon.
Valsa spp., on dead twigs & canes. V. ambiens Pers. ex Fr., N.J.; V. ribesia Karst., Calif.; V. ribicola Ell. & Ev., Kans., Mo.

RICINUS (EUPHORBIACEAE)

RICINUS COMMUNIS L., CASTOR-BEAN. Shrub or small tree of tropical Africa(?), widely naturalized in warm regions; herbaceous and grown as an annual in temperate regions for castor oil obtained from the seeds and for ornament. Variable, occurring in many forms, sometimes separated as spp.

Alternaria sp., leaf spot. Fla., La., Texas.
A. brassicae (Berk.) Sacc. N.Y.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug. and var. chromogena Shear et al., on stems. Fla., T.H.
Botrytis sp., gray mold. Conidial stage of Sclerotinia ricini.
Cercospora canescens Ell. & Mart., leaf spot. Ala., Kans., Mo.,N.J., P.R.
C. ricinella Sacc. & Berl., white leaf spot. Gulf States, Mo., Calif., West Indies. (Perhaps more commonly known as Cercosporina ricinella (Sacc. & Berl.) Speg.)

RICINUS COMMUNIS -- continued.

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Didymella ricini Ell. & Ev., on stems. La.
Diplodia sp., on capsules or stems. Fla., Tenn.
D. natalensis Pole-Evans, on stems. Ala. See Physalospora.
Fusarium scirpi Lamb. & Fautr. var. acuminatum (Ell. & Ev.) Wr. and F. sambucinum Fckl., on stems. La.
Heterosporium sp., on capsules & leaves. Calif.
Phomopsis ricini Grove, on stems. S.Car.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora sp., on stems & capsules. P. fusca N.E. Stevens, Fla.; P. obtusa (Schw.) Cke.; P. rhodina (Berk. & Curt.) Cke. Ala., Fla.
Phytomonas solanacearum (EFS.) Bergey, bacterial wilt. Ala., Fla., Ga., Mich.
P. tumefaciens (EFS. & Town.) Bergey, crown gall. Despite the extensive use of Ricinus as an experimental host, there are no reports of natural crown gall infection in the U.S.
Phytophthora palmivora Butl., T.H.
P. parasitica Dastur var. nicotianae Tucker, stem rot. Known only from experimental inoculation in the U.S., including P.R., though reported to cause seedling blight in India and the East Indies.
Pythium spp., root rot. T.H.
Rhizoctonia solani Kühn, damping off. Fla., Kans.
Schizophyllum commune Fr., on stems. Fla.
Sclerotinia ricini Godfrey, inflorescence blight, gray mold. Ga. to Fla. & Texas. Conidial stage is Botrytis sp.
Sclerotium rolfsii Sacc., Southern wilt. Fla.

ROBINIA (LEGUMINOSAE)

ROBINIA HISPIDA L., ROSE-ACACIA. Shrub of Growth Regions 25, 27, 28; cult. for ornament, Zone V.

Alternaria fasciculata (Cke. & Ell.) Jones & Grout (? A. tenuis Nees ex Wiltshire), leaf spot. N.Dak.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Tryblidiella rufula (Spreng. ex Fr.) Sacc., on twigs. Ala.

ROBINIA PSEUDOACACIA L., BLACK LOCUST. Large but short-lived tree of eastern N. America, widely cult. and naturalized, Zone III; grown for timber, soil conservation, shade and ornament in numerous geographic and hort. forms.

Aglaospora anomia (Fr.) Lamb. (A. profusa (Fr.) Ces. & DeNot.), canker, twig blight. Me. to Ga. & Mich.
Alternaria sp., seedling leaf blight. N.Car. to Ala. & Mo.
Armillaria mellea Vahl ex Fr., root rot.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on branches. Ga., Tenn., Va.

ROBINIA PSEUDOACACIA -- continued.

Calonectria dearnessi Ell. & Ev., on branches. Mo.
Cladosporium epiphyllum Pers. ex Fr., ? leaf spot. Tenn., W.Va.
Coryneum trimerum Sacc., on branches. Idaho, Wash.
Cryptosporium robiniae Dearn. & House, on twigs. N.Y.
Cucurbitaria elongata (Fr.) Grev. (Camarosporium robiniae (Westend.) Sacc.), on branches. Widespread.
Cuscuta sp. and C. arvensis Beyr., dodder, on seedlings. Md. to Ark. & Mo. Widespread.
Cylindrosporium solitarium Heald & Wolf, leaf spot. Texas. See also Phleospora.
Cytospora coccinea (Reb.) Fr. and C. leucosperma Pers. ex Fr. Conidial stage of Aglaospora anomia.
(C. orthospora Berk. & Curt. and C. robiniae Schw.): Phomopsis oncostoma.
Daedalea unicolor Bull. ex Fr., wood rot. Wis.
Diaporthe oncostoma (Duby) Fckl. (Phomopsis oncostoma (Thüm.) Höhn.), canker, dieback. N.Y. to Ga. & Ill.
Dothiorella glandulosa (Cke.) Sacc., on branches. Va., W.Va.
Erysiphe polygoni DC., powdery mildew. Calif.
Fomes applanatus (Pers. ex Fr.) Gill., white mottled heart rot. Calif.
F. igniarius (L. ex Fr.) Kickx, white spongy heart rot. Ill., W.Va.
F. rimosus (Berk.) Cke., yellow spongy heart rot. Mass. to Ala., N. Mex. & Wis. On living trees.
Fusarium sp., seedling root rot. Ala., Ga.
F. avenaceum (Fr.) Sacc., on twigs. Pa.
F. sarcochroum (Desm.) Sacc., twig canker. Iowa.
Fusicladium robiniae Shear, seedling leaf blight. Md. to Ala., Mo. & Wis.
Gibberella baccata (Wallr.) Sacc. (Fusarium lateritium Nees), on twigs. Mich., S.Car.
Gloeosporium revolutum Ell. & Ev., leaf spot. N.J.
Herpotrichia lanuginosa (Berk. & Curt.) Ell. & Ev., on decaying wood. S.Car., Va.
Heterodera marioni (Cornu) Goodey, root knot. Okla.
Macrophoma numerosa Pk., on branches. N.Y., Pa.
Microsphaera diffusa Cke. & Pk., powdery mildew. Ill., N.Car.
Melanconium viscosum Schw., on dead branches. Mo., Pa.
Nectria cinnabarina Tode ex Fr., on branches. Widespread.
N. coccinea Pers. ex Fr. W.Va.
Phleospora robiniae (Lib.) Höhn., leaf spot. N.Y. to Ohio & Wis. (Reported also as Cylindrosporium or Septoria.)
Phoradendron flavescens (Pursh) Nutt., mistletoe. N.Car.
P. f. var. macrophyllum Engelm. Ariz., N.Mex.
Phyllactinia corylea Pers. ex Karst., powdery mildew. N.Mex.
Phyllosticta robiniae Sacc., leaf spot. La.
Phymatotrichum omnivorum (Shear) Dug., root rot. Okla., N.Mex., Tex.
Physalospora obtusa (Schw.) Cke., on branches. Me. to Va. & Mich.; Kansas.
Phytophthora cinnamomi Rands, seedling stem rot. Md.
P. parasitica Dastur, seedling top wilt. Ala., N.Car., Va.

ROBINIA PSEUDOACACIA -- continued.

Polyporus robiniophilus (Murr.) Lloyd, white spongy heart rot. Pa. to Va., Mo. & Mich.

P. sulphureus Bull. ex Fr., brown cubical heart rot. Mass., N.Y., W.Va.

Polyporus spp., wood rot, sometimes sapwood or heart rot of living trees. P. biformis Klotzsch, Ky.; P. gilvus (Schw.) Fr., W.Va.; Wis.; P. hirsutus Wulf. ex Fr., N.Y.; P. obtusus Berk., Md.; P. unitus Pers., Idaho, Ind., Ky., Va.

Poria spp., wood rot. P. ambigua Bres., Mich.; P. ferruginosa (Schrad. ex Fr.) Bres., W.Va.; P. incrassata (Berk. & Curt.) Burt, on posts, widespread; P. robustus Karst., Calif.; P. umbrina Fr., Md., Va.

(Pseudovalsa profusa (Fr.) DeNot.): Aglaospora anomia.

Pythium spp., damping off. Nebr., Texas.

P. myriotylum Dreschsler, seedling root rot. N.Car.

Rhabdospora breviuscula (Berk. & Curt.) Sacc., on branches. S.Car.

Rhizoctonia bataticola (Taub.) Butler, seedling stem rot. Ala., N.Car.

R. solani Kühn, damping off, seedling leaf blight. Md. to Ala., Texas & Nebr.

(Septoria curvata (Rabh. & Br.) Sacc.): Phleospora robiniae.

(Sphaeropsis robiniae Ell. & Barth.): Physalospora obtusa.

Verticillium albo-atrum Reinke & Berth., wilt. Ill.

Xylaria longeana Rehm and X. polymorpha (Pers.) Grev., wood rot, usually on stumps or dead trunks. Cosmopolitan.

Chlorosis, -- mineral deficiency, probably iron, in alkaline soil. Nebr., Texas.

Little leaf, -- zinc deficiency. Calif.

Witches'-broom (brooming disease), Hartley & Haasis ex Smith (Chlorogenus robiniae Holmes). Pa. to Ga. & Ark.; ?Nev.

ROBINIA spp. Especially R. NEOMEXICANA Gray, NEW MEXICO LOCUST, shrub or small tree of Growth Regions 9, 10, 11, 14; and R. VISCOSA Vent, CLAMMY LOCUST, tree of G.R.'s 27, 28, 29, cult. Zone III.

Cucurbitaria elongata (Fr.) Grev., on branches. N.Y.

Fomes rimosus Berk., yellow spongy heart rot. Ariz., N.Mex.

Melanconium viscosum Schw., on twigs. Pa.

Phomopsis oncostoma (Thüm.) Höhn., on twigs. N.J.

Phyllactinia corylea Pers. ex Karst., powdery mildew. N.Mex.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

Physalospora obtusa (Schw.) Cke., on branches. Pa.

ROLLINIA (ANNONACEAE)

ROLLINIA DELICIOSA Safford, BIRIBA. Tropical American cult. for edible fruit in West Indies and S. Fla.

Glomerella cingulata (Ston.) Spauld. & Schrenk, dieback, fruit rot. Fla.

RONDELETIA (RUBIACEAE)

RONDELETIA spp. Evergreen shrubs or trees; some are grown for ornament in tropical America, or under glass.

Echidnodella rondeletiae Ryan, black leaf spot. P.R.
Morenoella decalvans (Pat.) Theiss. var. rondeletiae Ryan, on leaves. P.R.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

NOTES ON PLANT DISEASES IN KANSAS IN 1941[1/]

C. O. Johnston

During the period from 1935 to 1938, the writer, in collaboration with others, published a series of articles dealing with annual observations on plant diseases in the State, entitled "Kansas Mycological Notes" in the Transactions of the Kansas Academy of Science (1), (2), (3), (4).

The present article is a revival of that series of notes and it is planned to prepare similar articles annually. These will record the important or unusual plant disease developments in the State, as well as the prevalence and severity of certain economically important diseases each year. It is not claimed that the list will be complete for all of the diseases occurring in Kansas each year, but it will include all those of importance.

The unusual weather conditions that prevailed in much of Kansas during the spring and summer of 1941 favored many unusual disease developments on cultivated crops and native vegetation. In the western part of the State good rains during the late summer and fall of 1940, with the consequent restoration of subsurface soil moisture, resulted in a considerable increase in the vegetation and produced the best stands and growth of winter wheat that had been obtained in that area in many years. These conditions followed by a mild winter and exceedingly heavy rains in May and June 1941, and a second period of heavy rains in September and October resulted in unusually heavy infections of many diseases.

Important or Unusual Development of Diseases of Cereal, Forage, and Fiber Crops. -- The short period of extreme heat in July 1940, followed by good rains in August, resulted in the appearance of unusually large amounts of volunteer wheat, oats, and barley. The same conditions also favored oversummering of cereal rusts and heavy infections developed on volunteer grains during the late summer and early fall. By the middle of October volunteer plants of oats and barley were heading; and such plants usually were heavily infected with stem rust. Considerable crown rust (Puccinia coronata) appeared on volunteer oats late in October but did not become so abundant as stem rust (P. graminis avenae). Both leaf rust (P. rubigo-vera tritici) and stem rust (P. graminis tritici) infec-

---

1/ Contribution No. 433, Department of Botany and Plant Pathology, Kansas State College.

tion were heavy on volunteer winter wheat in the eastern half of the State and leaf rust was abundant in western counties. Infection became so severe in many fields of early sown wheat in the central part of Kansas that much of the top growth was destroyed and the amount of fall pasture seriously reduced.

The absence of killing frost at the normal time favored the development of all of these rusts up to the sudden severe freeze of November 11, 1940. Extremely low temperatures at that time killed volunteer oats and barley and all rusts on these crops disappeared rapidly. Urediospores of stem rust collected on dead oats and barley plants in December and in January, 1941, failed to germinate. Stem rust on winter wheat declined rapidly in abundance after the freeze of November 11, but a little infection still could be found in late December. After the first of January stem rust uredia could be found only on dead leaves and the spores failed to germinate. It seems unlikely, therefore, that stem rust on wheat, barley, and oats, and crown rust on oats overwintered as far north as Manhattan, Kansas, in 1940-41.

Leaf rust of wheat also decreased in abundance after the severe freeze of November 11, 1940, but it could be found with considerable ease in nearly all fields throughout the winter. By the middle of February fresh uredia began to appear and it became clear that leaf rust was overwintering in unusually large amounts. The surprising feature of the situation was the occurrence of overwintering in the western part of the State. This was due to the mild winter, the abundance of rust in the fall, and the heavy top growth of winter wheat that provided ample protection for uredia on leaves near the ground.

Although leaf rust of wheat overwintered in Kansas in considerable abundance, cool, dry weather during April and the early part of May prevented the rapid increase of rust from overwintered infection centers and there was not an unusually large amount of leaf rust in the State until after the middle of May. However, there were severe infections of leaf rust in Oklahoma and Texas before that time and extremely heavy showers of spores from those sources occurred in Kansas during the last half of May. This, combined with frequent heavy rains, wet soil, and heavy dews, resulted in a rapid increase in infection. By June 1 leaf rust had appeared in nearly all fields in alarming proportions, and it was soon evident that Kansas was experiencing an epiphytotic of leaf rust fully as severe as that of 1938. Maximum infection was not reached so early in 1941 as in 1938, and losses, therefore, were not so heavy but it is estimated that leaf rust caused a reduction of at least 5% in the yield of the 1941 Kansas wheat crop.

The wet weather of May and June also favored the development of other rusts. Crown rust appeared on oats in the eastern half of Kansas early in June and rapidly increased to epiphytotic proportions. By June 15 crown rust infection was the heaviest the writer ever has observed in Kansas and most oats in the eastern half of the State were badly lodged as a result of a combination of heavy crown rust infection and torrential rains. The losses due to crown rust on oats undoubtedly were heavier than those caused by leaf rust on wheat.

Stem rust (Puccinia graminis) was present on wheat, oats, and barley by the middle of June but infection was late in appearance and

developed less rapidly than is usually expected, because of temperatures slightly too low for the rapid spread of those rusts. Losses were severe in some localities but were not so large or widely distributed as in 1935 and 1937 -- years of severe stem rust epiphytotics. The advent of hot weather and rapid maturity of crops shortly after June 20 prevented large late-season losses. In the case of stem rust on wheat, it was notable that Kanred had much less infection in 1941 than other hard red winter varieties. This apparently was due to the prevalence of physiologic race 17 to which Kanred is resistant. Race 17 has been increasing in prevalence in Kansas for 2 years.

Other rusts of unusual severity in Kansas in 1941 were leaf rust of rye (Puccinia rubigo-vera secalis), leaf rust of barley (P. anomala), and rust of flax (Melampsora lini). Leaf rust on rye was the heaviest the writer has ever observed, and experimental plots of Common Winter and Balbo varieties were severely damaged. Leaf rust of barley, although relatively rare in Kansas, was severe on both winter and spring barley at Manhattan. Flax rust, which likewise seldom occurs in Kansas, produced a moderate infection in experimental plots at Manhattan. Considerable infection occurred on Linota and light infection was present on Redwing. Bison had less infection than the other 2 varieties.

Another rust that seldom appears in abundance in Kansas, but was fairly abundant in 1941, was sorghum rust (Puccinia purpurea). As usual the disease did not appear until early October. Thereafter, it was abundant on the lower leaves of Atlas sorgo at Manhattan.

Rust on alfalfa (Uromyces striatus) also appeared in late summer and fall in the north central part of the State.

Several diseases of cereal crops, usually considered of minor importance in Kansas, were present in abundance in 1941. Mildew (Erysiphe graminis) was particularly severe on wheat and barley in the early spring. On wheat this disease reached the greatest severity ever observed and undoubtedly caused some reduction in yield through early defoliation of plants in lowland fields. Speckled leaf blotch (Septoria tritici) and glume blotch (S. nodorum) were abundant on winter wheat. The former was particularly severe in the southeastern one-fourth of the State and it was noted that the variety Kawvale was extremely susceptible. Many fields of Kawvale in that area were prematurely defoliated by S. tritici. Glume blotch was most severe in south-central counties and was associated with severe lodging of wheat during the wet weather of June. Yellow mosaic (virus) of wheat also appeared in considerable abundance in Saline and Dickinson counties and caused severe losses in some fields. Loose smut of wheat (Ustilago tritici) continued to be an important disease in the State in 1941, although apparently it was not so severe as in recent years. There was a larger increase in eastern counties where the susceptible variety Clarkan is increasing in acreage than in other parts of the State.

Other Diseases of Minor Importance or of Ordinary Severity in 1941 -- Many other diseases of cultivated and uncultivated plants were present in Kansas in ordinary or minor amounts. Those observed by or reported to the writer are listed below with brief comments on each.

Diseases of Cereal, Forage, and Fiber Crops

Avena sativa, oats.

Phytomonas coronafaciens, halo blight. Infection general but light, damage slight.

Ustilago avenae and U. levis, loose and covered smuts. Widely distributed in the State and severe on Kanota. This is the Fulghum type of smut. The new resistant variety Fulton bore only light infection.

Blast (cause unknown). Prevalent but not severe.

Hordeum vulgare, barley.

Erysiphe graminis, mildew. Severe on both winter and spring barley, causing some loss.

Helminthosporium sativum, spot blotch. Prevalent on spring barley at Manhattan and on winter barley in southern Kansas.

Pyrenophora teres, net blotch. Particularly severe on volunteer barley in the fall of 1940. Moderate amounts on both spring and winter barley at Manhattan in the spring of 1941.

Phytomonas translucens, bacterial blight. Very severe on some varieties of spring barley at Manhattan.

Ustilago hordei, covered smut. Especially prevalent on winter barley in southern Kansas. Some on spring barley in western Kansas.

Ustilago nuda, loose smut. Common on spring barley.

Linum usitatissimum, flax.

Fusarium lini, wilt. Traces in experimental plots and some fields in southeastern Kansas.

Sorghum vulgare, sorghum.

Bacterium andropogonis, leaf stripe. Common on some varieties of sorghum in experimental plots at Manhattan. Particularly severe on feterita.

Sphacelotheca sorghi, covered kernel smut. Common in occasional fields of untreated sorghum.

Sphacelotheca cruenta, loose kernel smut. Occasional heads observed at Manhattan.

Sorosporium reilianum, head smut. Occasional heads observed.

Sclerotium [Rhizoctonia] bataticola, charcoal rot. Fairly common in southwestern counties.

Pythium arrhenomanes, milo disease. Common on nonresistant strains of milo and milo hybrids in central and western counties.

Weakneck (cause undetermined). Reported as occurring in fields of Colby milo, and known to occur in Early Kalo, Improved Coes, Greeley, Cheyenne, Wheatland and other sorghums in northwestern Kansas shortly before maturity.

Triticum vulgare (T. aestivum), wheat.

Ophiobolus graminis, take-all. Severe in some fields in north central and northwestern counties.

Helminthosporium spp., dry land foot-rot. Fairly common in western Kansas.
Gibberella saubinetii, scab. Traces observed in extreme southeastern part of State.
Phytomonas atrofaciens, basal glume rot. Fairly prevalent in eastern Kansas. Especially severe on Kawvale.
Phytomonas translucens undulosum, black chaff. Observed in occasional fields, especially in lodged spots or lowland fields.
Tilletia levis, bunt. Scattered in occasional fields over the State. Particularly severe on Clarkan in eastern Kansas and Chiefkan in central counties.

Zea mays, field corn.
Ustilago zeae, smut. Lightly distributed wherever corn was grown. Less abundant than usual, probably due to wet weather.
Puccinia sorghi, rust. Fairly abundant in the eastern half of the State during late summer and early fall.

Diseases of Legumes

Medicago sativa, alfalfa.
Ascochyta imperfecta, black stem. Common in experimental plots at Manhattan and in fields in some localities.
Phytomonas insidiosa, bacterial wilt. Severe in many old fields.
Peronospora trifoliorum, downy mildew. Severe during wet weather of May and June in some localities. Caused considerable defoliation.

Melilotus alba, white sweet clover.
Mosaic (virus). Common on both cultivated and roadside white sweet clover.

Vigna sinensis, cowpea.
Uromyces phaseoli vignae, rust. Observed in experimental plots at Manhattan.

Diseases of Grasses

Aegilops cylindrica, goatgrass.
Puccinia graminis tritici, stem rust. Common along roadsides in south central Kansas.

Andropogon spp., bluestem.
Puccinia andropogonis, rust. Severe on A. furcatus and A. scoparius in the vicinity of Manhattan.
Sorosporium everhartii, smut. Traces observed on A. furcatus at Manhattan.

Bouteloua curtipendula, sideoats grama.
Puccinia boutelouae, rust. Common in grassland near Manhattan.

Bromus inermis, smooth bromegrass.
Phytomonas coronafaciens atropurpureum, bacterial blight. Severe on leaves, peduncles and panicles of bromegrass in vicinity of Manhattan.
Mosaic (virus). Prevalent in grassland border of cereal rust nursery at Manhattan.

Bromus japonicus, Japanese bromegrass.
Ustilago bromivora, smut. Occasional smutted plants in wasteland and roadsides.

Buchloë dactyloides, buffalo grass.
Puccinia kansensis, rust. Severe in experimental plantings at Manhattan in late August and September.

Dactylis glomerata, orchard grass.
Puccinia graminis, stem rust. Fairly common on plants near cereal plots in the fall.

Digitaria sanguinalis, crabgrass.
Piricularia grisea, leaf spot. Common on crabgrass in wasteland and roadsides.
Ustilago rabenhorstiana, smut. Occasional occurrence noted near Manhattan.

Hordeum pusillum, little barley.
Puccinia rubigo-vera similis, rust. Severe in eastern Kansas during June and July.

Panicum virgatum, switchgrass.
Uromyces graminicola, rust. Severe on both wild and cultivated plants in central Kansas.
Phyllachora graminis, black blotch. Very severe on both wild and cultivated plants in central Kansas.

Paspalum stramineum.
Puccinia substriata, rust. Fairly common in wasteland in central Kansas, especially around McPherson.

Poa pratensis, bluegrass.
Erysiphe sp., mildew. Common in shaded places in lawns during June.
Puccinia rubigo-vera agropyri, rust. Fairly common in shaded spots on lawns in eastern Kansas during June.

Spartina pectinata, slough grass.
Puccinia peridermiospora, rust. Very common and severe in vicinity of Manhattan.

Triodia flava, purpletop.
Puccinia windsoriae, rust. Common in grassland at Manhattan during September and October.

Tripsacum dactyloides, gamagrass.
Puccinia tripsaci, rust. Collected in experimental plots at Manhattan during October and November.

Tree Diseases

Crataegus crusgalli, cockspur thorn.
Gymnosporangium sp., rust. Extremely severe on trees in ornamental plantings on Kansas State College campus, causing defoliation during late summer. The fruits on some trees were severely attacked, each fruit bearing many aecia with extremely long cylindrical peridia.

Populus sp., cottonwood.
Melampsora medusae, rust. Unusually abundant in Kansas.

Salix sp., willow.
Melampsora sp., rust. Unusually severe in Kansas.

Ulmus americana, American elm.
Gnomonia ulmea, black leaf spot. Very common in the eastern half of Kansas. Some defoliation noted at Manhattan in late summer. Occasional trees seem resistant.

Miscellaneous Diseases

Althea rosea, hollyhock.
Puccinia malvacearum, rust. This disease prevalent in eastern Kansas. Infection heavy at Manhattan on both old and seedling plants during October and November. The disease seldom has been seen here.

Ambrosia trifida, giant ragweed.
Puccinia xanthii, rust. Prevalent in north central Kansas.

Helianthus spp.
Erysiphe cichoracearum, powdery mildew. Very abundant.
Puccinia helianthi, rust. Very abundant.

Ipomoea sp., morning glory.
Albugo ipomoeae-panduranae, white rust. Common on wild blue morning glory.

Iris sp., iris.
Didymellina macrospora, leaf spot. Prevalent on most bearded iris.

Polygonum scandens, climbing false buckwheat.
Puccinia polygoni-amphibii, rust. Abundant in northeastern fourth of the State, September to November.

Xanthium spp., cocklebur.

Puccinia xanthii, rust. Abundant in the vicinity of Manhattan on X. pennsylvanicum and X. chinense.

Zinnia elegans, zinnia.

Erysiphe cichoracearum, powdery mildew. Abundant in most parts of Kansas.

Mosaic (virus). Observed at Manhattan.

REFERENCES

1. Lefebvre, C. L., and C. O. Johnston. Kansas mycological notes, 1934. Trans. Kans. Acad. Sci. 38: 101-103. 1935.
2. _____. Kansas mycological notes, 1935. Trans. Kans. Acad. Sci. 39: 95-101. 1936.
3. Johnston, C. O., C. L. Lefebvre, and E. D. Hansing. Kansas mycological notes, 1936. Trans. Kans. Acad. Sci. 40:69-74. 1937.
4. _____, and Travis E. Brooks. Kansas mycological notes, 1937. Trans. Kans. Acad. Sci. 41: 121-123. 1938.

(COOPERATIVE INVESTIGATIONS BETWEEN THE DIVISION OF CEREAL CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE, AND THE KANSAS AGRICULTURAL EXPERIMENT STATION).

FURTHER NOTES ON THE FUNGI OF NEVADA

John A. Stevenson and W. A. Archer

Since the publication (Plant Dis. Reporter 24: 93-103. 1940) of a list of the fungi of Nevada based on the collections of the second author a number of additional specimens from the same source have come to hand and are here recorded.

Albugo candida (Pers. ex Lév.) O. Kuntze: On Descurainia pinnata var. paradisa (Nels. & Kenn.) M.E. Peck, Hunter's Creek road, s.w. of Reno, Washoe Co.

Erysiphe cichoracearum DC.: On Cryptantha echinella Greene, Wassuk Range above Cory Canyon, Mineral Co.; Mertensia oblongifolia var. nevadensis (Nels.) Wms., Becky Mt., White Pine Co. New hosts.

Phragmidium montivagum Arth.: On Rosa woodsii Lindl., Cory Creek, Wassuk Range, Mineral Co.

Puccinia aristidae Tracy: On Thelypodium sagittatum (Nutt.) Endl., east slope Toiyabe Range, Smoky Valley, Nye Co.

Puccinia oenotherae Vize: On Oenothera brevipes Gray, Porter's Well, Clark Co., and south of Nelson, Eldorado Canyon, Opal Mts., Clark Co.; on O. clavaeformis Torr. & Frém., Cory Creek, Wassuk Range, Mineral Co.; on O. contorta var. flexuosa (Nels.) Munz, Wassuk Range, near Big Indian Mt., Mineral Co. These are new hosts.

Puccinia palmeri Diet. & Holw.: On Penstemon sp., Cottonwood Canyon, Mt. Grant, Mineral Co. New to the State.

Puccinia thlaspeos Schub.: On Thlaspi sp., Lamoille Lake, Ruby Mts., Elko Co. New to the State.

Puccinia vagans (DC.) Arth.: On Gayophytum diffusum T. & G., Chicken Creek, west of Mountain City, Elko Co.; on G. lasiospermum Greene, Wassuk Range, above Cory Canyon, Mineral Co.; on G. nuttallii near var. abramsii Munz, Incline, Washoe Co. New to the State on the first and third host species.

Uromyces aemulus Arth.: On Allium validum S. Wats., Snow Valley Peak, south of Marlette Lake, Ormsby Co.

Uromyces intricatus Cke.: On Eriogonum sp., Cory Creek, Wassuk Range, Mineral Co.; on Eriogonum kearneyi Tidestrom, Cory Creek, Wassuk Range, Mineral Co. New to the State on the latter host species.

Uromyces punctatus Schroet.: On Astragalus artipes Gray, Tonopah-Reese River Road, Nye Co. A new host.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY AND DIVISION OF PLANT EXPLORATION AND INTRODUCTION, U. S. BUREAU OF PLANT INDUSTRY).

COMMITTEE REPORT ON RING ROT OF POTATOES IN 1941

The committee appointed by the American Potato Association for the purpose of stimulating and coordinating research on ring rot [Phytomonas sepedonica] has again made a survey to determine the extent of the occurrence of this disease in the United States in 1941. On the basis of this survey, the committee submits the following report:

Replies received from 38 States reveal that in 17 States the disease was less prevalent than a year ago, whereas 8 States reported the disease more widespread than in 1940. In one State 33% of the carload lots shipped in 1940 contained ring rot, whereas in 1941 only 6% showed the disease. Another State mentioned that during the last 2 years the losses in one county alone were $200,000, while this year, with greater care in handling the seed, the loss did not exceed $10,000. Most of the States attributed the decrease in ring rot to the campaigns that were put on during the winter through meetings and publicity on control measures; to change in seed stocks; and to the low price of certified seed in 1940, which enabled more growers to plant certified seed.

The disease is most serious in home gardens and on farms where not much attention is paid to the source of seed. Although in many cases the planting of certified seed has given satisfactory results, in some instances the results were disappointing. One State reported the distribution ofseveral carloads of certified seed potatoes that contained enough ring rot to produce from 10 to 50% plant infection. The consensus of opinion is that the outlook for control is good as long as the certifying agencies in the seed-producing States maintain rigid control..

Attention was called to the difficulty of accurate diagnosis of the disease in the field, especially after an early frost. In such cases, and in some others, the inspector will have to rely on examination of the tubers in the bin. In order that a more complete and thorough inspection may be made it is recommended that in addition to field inspection, at least 4 25-pound random samples for each 1,000 bushels stored be examined by cutting each individual tuber. Suspected tubers should be examined under fluorescent light, or smears should be made for examination under

the microscope. Inasmuch as the tuber symptoms become more distinct later in the season, it is desirable to make the bin inspection as late in the winter as possible.

More detailed experiments on the damage caused by planting seed containing a trace of ring rot should be conducted. More information is needed on methods of disinfecting bags, crates, storage houses, and farm machinery. The educational campaign to inform the growers of the seriousness of this disease and its occurrence in non-certified potatoes should be continued.

R. W. Goss
J. G. Leach
T. P. Dykstra, Chairman
(THE COMMITTEE OF THE POTATO ASSOCIATION OF AMERICA TO COORDINATE RESEARCH ON NEW AND UNUSUAL POTATO DISEASES).

A DEFOLIATION OF TOMATOES IN INDIANA CONTROLLED BY SPRAYING WITH MANGANESE SULFATE

H. Rex Thomas

A severe defoliation of the tomato plant distinct from defoliation caused by Alternaria solani (Ell. & Mart.) Jones & Grout, Septoria lycopersici Speg., Phytomonas vesicatoria (Doidge) Bergey et al., or by a deficiency of nitrogen, phosphorus or potassium, was observed in Indiana during the summer of 1940 and was found again in 1941. Affected plants were first noticed in Allen County in the northeastern part of Indiana, but have since been found in Adams, Tippecanoe, Clinton, and Marion Counties.

The first observable symptoms have been a chlorosis and inward rolling of the young leaflets closely followed by a necrotic spotting. The necrotic areas become progressively larger, coalesce, and finally cause the leaflets to wither and die. Severely affected plants have only a tuft of leaves at the tips of the stems, the lower leaves having died. The affected plants are stunted and the foliage has a light green color which enables one to locate areas from the edge of the field.

With the exception of one 12-acre field which was uniformly affected, the diseased plants have been confined to low areas in the field where the soil is compact and poorly aerated, frequently referred to as a "gumbo." The soil in the northeastern part of the State where the trouble was first found is classified as a Fouling clay.

In the other sections, Brookston and Crosby are the prevalent soil types where the deficiency has appeared. The pH of the soil in affected areas ranged from 7 to 7.5, in unaffected areas from 5.7 to 6.4. In 1940, the season was extremely dry and it was uncertain whether the drought might not have been partly responsible for the defoliation. However, the same symptoms were found in 1941, when in June and July the rainfall was above normal.

In 1940, solutions of manganese sulfate, ferric sulfate, borax, or zinc sulfate were sprayed on the leaves of affected plants, or a dilute

solution of sulfuric acid was added to the soil. Only those plants sprayed with manganese sulfate or growing on the acid-treated soil produced new growth free of necrotic spotting. In 1941 affected plants were sprayed late with solutions of manganese sulfate and ferric sulfate but no positive recovery was obtained. The lateness of these treatments in the growing season may explain the failure of the plants to respond. A fieldman for a tomato cannery with acreage located in the northeastern part of the State sprayed affected plants with manganese sulfate early in the 1941 season and reported rapid recovery. As yet, attempts to reproduce the symptoms in the greenhouse on plants grown in soil taken from affected areas in the field have been unsuccessful. Apparently, disturbance of the soil texture, or environmental conditions, may effect the availability of the manganese to the plant.

(CONDUCTED AS A PHASE OF COOPERATIVE INVESTIGATIONS BETWEEN THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE, AND THE DEPARTMENT OF BOTANY, INDIANA AGRICULTURAL EXPERIMENT STATION).

DITYLENCHUS DIPSACI ON TRIFOLIUM PRATENSE IN NEW YORK STATE

R. W. Henderson

The stem or bulb nematode, Ditylenchus dipsaci, appeared in destructive numbers in red clover plants (Trifolium pratense) in the greenhouses of the Plant Breeding Department, Cornell University, at Ithaca, New York, during the winter of 1941-42.

The organisms were introduced into the greenhouse in September and November, in plants selected from varietal plots seeded in the spring of 1939. They spread to a large number of the selections, which were being propagated vegetatively in flats of sterilized sand. Their presence was first detected in January 1942. Specimens were submitted by A. G. Newhall of the Plant Pathology Department to G. Steiner and B. G. Chitwood of the United States Department of Agriculture, who identified them as Ditylenchus dipsaci (Kuhn 1858) Filipjev 1936.

The nematodes were not observed in the field from which the plants were taken. However, their presence in the field can be safely assumed since plants potted in steam-sterilized soil developed typical swellings on leaves, leaf petioles, and crowns. Examination of these swellings revealed the presence of eggs, larvae, and adults. Information concerning the source of the nemas, how long they have been present in the field, and to what extent they have become established, is lacking. The natural occurrence of this strain in red clover fields in New York is believed not to have been reported previously.

Since these organisms have rendered useless several hundred plant selections chosen for breeding purposes, a method for destroying the nemas without destroying the entire plant is desired. Preliminary attempts to accomplish this by treating the plants with hot water were unsuccessful. The possibility of obtaining nematode-free cuttings from certain portions of the plants is being investigated.

Seeds of several crop plants were planted in flats of steam-sterilized soil and watered with a suspension of eggs, larvae, and adults. Shortly after emergence typical swellings were observed on seedlings of the following plants: red clover, Trifolium pratense; white and Ladino clovers, T. repens; alsike clover, T. hybridum; strawberry clover, T. fragiferum; T. involucratum; soy bean, Soja max; field pea, Pisum arvense; alfalfa, Medicago sativa; and onion, Allium cepa.

Examination of the seedlings after 6 weeks revealed the presence of eggs, larvae, and adults in the seedlings of soy bean, field pea, and red clover. No stages of the organism could be recovered in 6-week old onion seedlings exhibiting pronounced symptoms. These preliminary experiments further indicated that this nema population was not adapted to wheat, Triticum vulgare; barley, Hordeum vulgare; oats, Avena sativa; rye, Secale cereale; dandelion, Taraxacum officinalis; and buckhorn plantain, Plantago lanceolata.

(CORNELL UNIVERSITY, ITHACA, NEW YORK).

REPORTS ON THE DEVELOPMENT OF APPLE SCAB

NEW YORK (reports from State College of Agriculture Weekly News Letter for dates given):

Western New York (April 27)

Orleans County - McIntosh sample, April 17. No ascospore discharge in 6 hours and very light in 20 hours. Perithecia: 12% pre-ascus; 50% ascus; 2% with hyaline spores; 4% with less than 10% of spores colored; 12% with 10 to 50% of spores colored; 20% with over 50% of ascospores colored. Monroe County - McIntosh sample 2 miles from lake April 18. Slight ascospore discharge in 5 hours, moderate in 20 hours. Perithecia: 3% pre-ascus; 41% ascus; 11% hyaline; 13% less than 10% colored spores; 22% with 25 to 50% colored spores; 10% with more than half the ascospores colored. Niagara County - McIntosh sample "midway from Lake Zone to earliest" gathered April 16 (early green tip). Too few perithecia for an accurate count. No colored spores noted but most perithecia contained well developed asci. No shoot in 3 hours. McIntosh sample from the Lake Zone, too few perithecia for count. No shoot in 3 hours. - W.D. Mills.

Wayne County - The apple scab fungus has developed rapidly during the warm weather of the past week. Variation in the development of the fungus in individual leaves is very marked. Few or no spores are colored in some leaves while others have almost 100% perithecia filled with brown spores.

In a McIntosh sample collected April 25 near Lyons leaves bearing large lesions discharged heavily during 4 hours in moist chamber, and 50 to 75 spores per low powered field of the microscope could be easily found on the slides.

A McIntosh sample collected April 26 near Sodus showed about the same development of the perithecia as above but the leaves were less severely scabbed and spore discharges were lighter. - F. H. Lewis.

Hudson Valley (April 20)

Apple scab perithecial development in the Hudson Valley seems to vary considerably from one location to another this year. Leaves of McIntosh collected during the week, from Rock City in Dutchess County and Warwick in Orange County, showed practically no perithecia with colored spores whereas a collection from Ohioville in Ulster County showed 14% of the perithecia with more than half of the spores colored and ready to discharge. - D. H. Palmiter, Poughkeepsie.

APPLE SCAB SPORE DISCHARGE DELAYED IN MARYLAND: Overwintered apple leaves collected late in March under apple trees in commercial orchards, examined in the orchard and later brought to the laboratory for further study, showed an abundance of small perithecia in all orchards. About April 2, following several rains and a heavy snow, the apple scab fungus began to develop rapidly, and scab spores were predicted, under normal weather conditions of one or more rains each week, to be shooting about April 15 on the Eastern Shore and Southern Maryland; about April 18 in Central Maryland, and about April 27 in Western Maryland. During the past 10 days there have been no rains or heavy dews and the scab fungus is very slow in developing.

At the present time scab perithecia are still small and the ascospores mostly undeveloped. The contents are still granular with some asci developing into the "banana bunch" in more advanced perithecia. Up to this time I have found no fully mature or ripe ascospores from leaves collected under orchard conditions. (E. A. Walker, April 28. University of Maryland).

A SUCCESSFUL SPRAY FOR BLUE MOLD OF TOBACCO

P. J. Anderson

Although fumigation with benzol or paradichlorobenzene when properly applied will give excellent control of blue mold [=downy mildew, Peronospora tabacina], the fumigation method has certain drawbacks. The seed beds must be very tightly constructed to prevent escape of the gas; but many seed beds in the Connecticut Valley are not so constructed and as a result the growers waste their time and money without getting control. The paradichlorobenzene method is also quite dependent on temperature and does not give sufficient evaporation at low temperatures. Benzol is inflammable and also, if splashed on the leaves, causes dead spots. Both substances must be applied at night and this causes dissatisfaction with the labor.

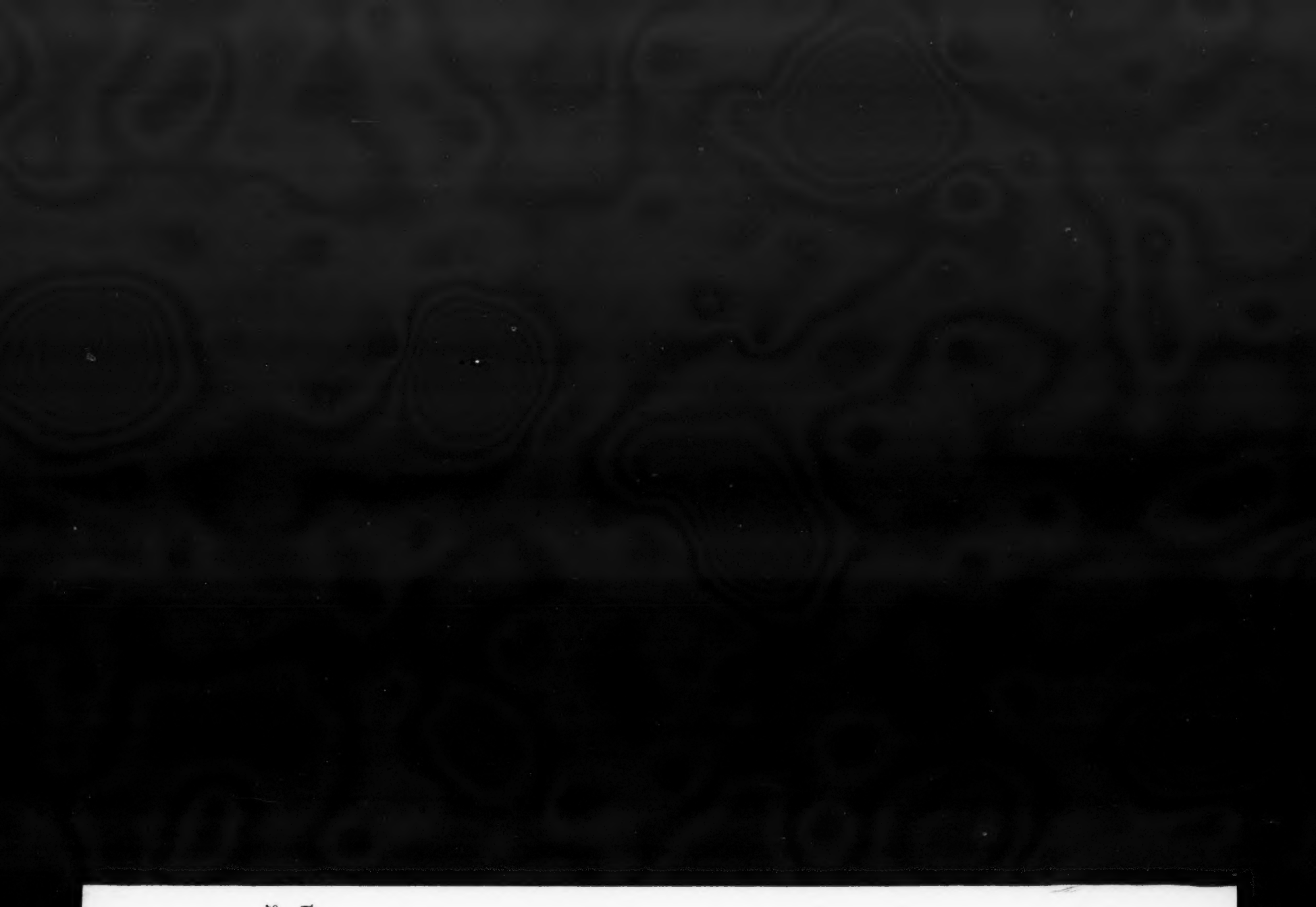
There is a distinct need for a simple but effective spray material. The writer has tested many materials during the last 4 years but up until 6 months ago has failed to find a satisfactory one.

Experiments on 4 crops of plants during the last winter in the greenhouse and also in the seed beds this spring have now demonstrated that ferric dimethyl dithiocarbamate will give 95 to 100% control. Best

control was obtained with a dilution of 1-1/2 to 2 grams of the material in a liter of water with the addition of an equal amount of lime. The plants were sprayed twice a week. Possibly further experiments will show that longer intervals or different dosages are equally good. During some of the tests there was a little leaf injury (chlorotic spots) from the spray, but this was never serious. Equally good control was obtained with sodium dimethyl dithiocarbamate, but this injured the plants some and was therefore not used in further trials.

This material is now being introduced by DuPont under the trade name of "Formate."

(CONNECTICUT AGRICULTURAL EXPERIMENT STATION, TOBACCO AND VEGETABLE SUB-STATION).

NOTES ON PLANT DISEASE CONTROL

"THIURAM DISULFIDE FOR TURF AND FOR TREATING SEEDS": In The Nursery Disease Notes of the New Jersey Agricultural Experiment Station (Vol. 14, No. 10, April 1942) P. P. Pirone reports experimental results indicating that tetramethyl thiuram disulfide (T.M.T.D.) will be a valuable substitute for the standard mercury compounds, red copper oxide, and formaldehyde, all of which are likely to be unavailable in the near future.